DRAFT TECHNICAL DOCUMENT
August 23, 2012

Requirements to Reduce Pollutants in Existing Stormwater Discharges Under the Stormwater Rulemaking

IV. Retrofit requirements in MS4 permits

As mentioned, the Phase I Rule does have a retrofit requirement related to existing structural flood control devices. Under 40 CFR 122.26(d)(2)((iv)(A)(4), Phase I MS4s were required to evaluate these devices to determine if retrofitting to provide additional stormwater pollutant removal was feasible.

As a result of these requirements, many states have included a similar requirement in their MS4 permits. Presented below is a summary of the type of retrofit requirements found in permits across the country. A summary of permit requirements and excerpts of permit language for many of the permits identified below is provided in Appendix A.

Assess Flood Management Projects for Water Quality Retrofits

Several Phase I MS4 individual permits require MS4s to assess impacts of flood management projects and where feasible, install stormwater quality features. Permits with retrofits for flood management projects include those found in Colorado (Lakewood, CO Phase I MS4 permit issued Jan. 30, 2009), Florida (Miami Phase I MS4 permit issued Feb. 3, 2004), Oklahoma (Oklahoma City Phase I MS4 permit issued January 19, 2007), and Texas (San Antonio Phase I MS4 permit). This type of requirement also appears in Phase II MS4 permits, such as Louisana's Phase II MS4 general permit (effective date Dec. 5, 2007).

Retrofit Program with Performance Standards

Many of the Phase I MS4 permits within the Chesapeake Bay watershed include permit requirements to restore a certain percentage of impervious surface area. Counties in Maryland, including Charles, Carroll, Frederick, Harford, Anne Arundel, Prince George's, and Montgomery, include requirements to restore a minimum of 10 percent of impervious surface area. Requirements for Montgomery County and Baltimore City would result in restoration of approximately 30 percent of impervious surface area. The Washington DC Phase I MS4 permit requires a program that establishes performance metrics for retrofit projects, including an estimated pollutant load and volume reduction, and implementation of retrofit projects for a minimum of 18 million square feet of impervious surfaces during the permit term.

In Wisconsin, both the MS4 General permit and MS4 individual permits require a 40 percent reduction in total suspended solids (TSS) in the existing urban area as compared to no controls by March of 2013. While this is not explicitly a retrofit requirement, many permitted MS4s are finding that they may need to retrofit to meet this performance standard.

Commented [c3]: We should include a note here, and exam if possible about how implementation plans are not required wit TMDLs and even when do exist are not necessarily included in permit.

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Pilot Retrofit Projects

Several Phase I MS4 permits in California include requirements for the implementation of pilot retrofit projects. The permit for East Contra Costa County (issued Sept. 23, 2010) requires MS4s to address stream restoration (geomorphic project) than can include the development of an inventory of potential retrofit projects for retention practices (Part C.8.d.iii, page 75). Also requires 10 pilot green street projects (Part C.3.b.iii, page 27). The Caltrans draft Phase I MS4 permit (draft dated August 18, 2011) included a requirement to conduct a minimum of 36 pilot LID retrofit projects statewide. The San Francisco Bay Municipal Regional Permit (issued Oct. 14, 2009) requires 10 pilot green street projects (Part C.3.b.iii, page 22).

The North Carolina Department of Transportation (NCDOT) permit (effective 9.10.2010) requires a BMP Retrofit program (Part II.B.2). The permit requires that NCDOT locate a minimum of 14 sites per year that are appropriate for retrofit installation and implement at least 5 retrofit projects per year with a total of 70 retrofits implemented over 5-year period of permit.

Retrofit Plans with Inventory and Ranking of Retrofit Opportunities
Several Phase I MS4 permits in California require the development of a retrofit plan that inventories and prioritizes potential retrofit projects. The Phase I MS4 permit for Orange County (issued December 16, 2009) and the Phase I MS4 permit for Riverside County (issued November 10, 2010) both require a retrofitting program that inventories and ranks sites for prioritization in work plans for following year (Section F.3.d) The San Francisco Bay Municipal Regional Permit (issued Oct. 14, 2009) requires MS4s to address stream restoration (geomorphic project) than can include the development of an inventory of potential retrofit projects for retention practices (Part C.8.d.iii, page 71).

In New York, the Phase II MS4 General Permit (issued April 29, 2010) requires a retrofit program (Part IX.A.5.b, page 72) for MS4s in the New York City East of Hudson Watershed.

Recently proposed MS4 Phase I permits in Oregon requires the development of a stormwater quality retrofit strategy that includes identification of developed areas or land uses impacting water quality that are high priority retrofit areas. By 2013, most co-permittees must identify one stormwater quality improvement project, at a minimum, to be initiated, constructed or implemented during the permit term that targets the reduction of applicable TMDL pollutant parameters.

The Tennessee Phase II MS4 general permit requires a retrofit plan for waters with approved TMDLs, where the TMDL implementation plan requires MS4s to retrofit existing developed sites that are impacting water quality. The plan must inventory and rank potential retrofit locations. The Utah Phase II MS4 general permit (effective August 1, 2010) contains similar retrofit plan development requirements, although the requirements in this permit are broader than waters with approved TMDLs to include both impaired and unimpaired waterbodies.

The Phase I Municipal Stormwater permit for Western Washington (issued January 17, 2007) requires development of a Structural Stormwater controls program to construct structural stormwater controls to prevent or reduce impacts to waters of the state caused by discharges from the MS4. The program is specific to areas of existing development, as well as some areas of new development where impacts are anticipated. Permittees are required to list the projects and provide an estimated pollutant load reduction.

V. Retrofit programs

The retrofit survey questions asked through the ICR of regulated MS4s provides information on the purpose and function of existing MS4 retrofit programs.

As shown in Table 1, of the responding Phase I and II regulated MS4s, approximately 30 percent have stormwater retrofit programs and 68 percent do not.

The purpose of stormwater retrofit programs vary among Phase I and Phase II MS4s, as shown in Table 4. Responding Phase I MS4 operators indicated that 26 percent of retrofit programs are intended to comply with permit requirements, compared to 9 percent of Phase II MS4s. For Phase I MS4s, MS4 operators indicated that the more significant purposes of retrofit programs include addressing flooding (23 percent); addressing watershed plan or local water quality, habitat or stream stability or geomorphology concerns (22 percent); and complying with TMDLs (20 percent). Addressing flooding was identified as one of the more significant purposes (12 percent) for stormwater retrofit programs among Phase II MS4s that participated in the ICR survey, second to addressing local watershed plans and water quality (10 percent).

Table 4. Regulated Phase I and Phase II MS4s Responding to the ICR Survey Question: What is the Purpose of the Stormwater Retrofit Program in Your MS4 Service Area?

	Phase I		Phase II		All	
Response	Yes	%	Yes	%	Yes	%
To comply with stormwater permit requirements	64	26%	20	9%	84	18%
As a demonstration site or training opportunity	36	14%	10	5%	46	10%
To comply with CSO long term control plan	7	3%	3	1%	10	2%
To address flooding	58	23%	26	12%	84	18%
To address wetlands mitigation	25	10%	4	2%	29	6%
To comply with Total Maximum Daily Load (TMDL) or other Clean Water Act water quality requirement(s)	50	20%	16	7%	66	14%
To comply with Safe Drinking Water Act (SDWA) wellhead protection or UIC regulations	10	4%	3	1%	13	3%
To comply with other federal regulations (ESA, CERCLA, WRDA, etc.)	12	5%	3	1%	15	3%

Response	Phase I		Phase II		All	
	Yes	%	Yes	%	Yes	%
Other requirements, such as state requirements	10	4%	3	1%	13	3%
To address watershed plan or local water quality, habitat or stream stability or geomorphology concerns	56	22%	22	10%	78	17%
Other	17	7%	1	0%	18	4%
Not applicable	15	6%	19	9%	34	7%

Appendix A. Summary of MS4 Permit Retrofit Requirements

California

Type of Retrofit Requirement: The retrofit requirements in California permits vary by Regional Board. Some MS4 permits include a general requirement to develop a retrofit program while other MS4 permits are more specific (like a requirement to install 10 green street projects).

Where: See permits below:

Caltrans draft Phase I MS4 permit (draft dated August 18, 2011) included a requirement to conduct a minimum of 36 pilot LID retrofit projects statewide.

Lake Tahoe (signed Dec. 6, 2011). The MS4 permit requires Pollutant Load Reduction Plans describing how the permittee expects to meet the TMDL limits. These plans will likely include retrofit projects.

East Contra Costa County (issued Sept. 23, 2010). Requires MS4s to address stream restoration (geomorphic project) than can include the development of an inventory of potential retrofit projects for retention practices (Part C.8.d.iii, page 75). Also requires 10 pilot green street projects (Part C.3.b.iii, page 27).

Orange County, Regional Board 9 (issued Dec. 16, 2009). Requires a retrofitting program that inventories and ranks sites for prioritization in work plans for following year (Section F.3.d)

San Francisco Bay Municipal Regional Permit (issued Oct. 14, 2009). Requires MS4s to evaluate retrofits to remove mercury (C.11.e) and PCBs (C.12.e). Requires MS4s to address stream restoration (geomorphic project) than can include the development of an inventory of potential retrofit projects for retention practices (Part C.8.d.iii, page 71). Also requires 10 pilot green street projects (Part C.3.b.iii, page 22).

Riverside County, Regional Board 9. (Issued November 10, 2010). Requires a retrofitting program that inventories and ranks sites for prioritization in work plans for following year (Section F.3.d)

Colorado

Type of Retrofit Requirement: Flood Control Assessment and Retrofit

Where: Phase I individual permits in Colorado require MS4s to assess impacts of flood management projects and where feasible, install stormwater quality features.

From the Lakewood, CO Phase I MS4 permit (issued Jan. 30, 2009):

3) Assess Impacts of Flood Management Projects. The permittee shall continue to implement procedures to assure that the impact on water quality is assessed for proposed flood management projects. The following water quality impact assessment shall be ongoing.

    a) Proposed channel improvements shall be evaluated as to their stability and need for grade control structures and bank protection. Where warranted to ensure stability,

such grade control structures and bank protection shall be implemented as part of the project.

b) Proposed municipally-owned regional detention facilities shall be evaluated as to the feasibility and potential effectiveness of installing stormwater quality features. Where determined to be feasible and effective, such stormwater quality features shall be implemented as part of the project.

c) Lakewood shall perform an assessment and report to the Division by March 31, 2010 to update its prior evaluation of the feasibility and water quality benefits of improvements to the City Pond at 14th and Lamar and the Benton Avenue Pond. Any and all improvements, re-scoped improvements, and alternative improvements determined to be feasible shall be completed by August , 2013.

The status of the improvements, and a list of all new flood management project facility reviews required by subparagraphs (3)(a) and (b) above, and whether water quality improvements were incorporated in these new projects, shall be included in each Annual Report.

DC

Type of Retrofit Requirement: Retrofit program with specific performance standards (minimum impervious surfaces required to be retrofit)

Where: DC MS4 permit (effective Oct. 7, 2011; expires Oct. 7, 2016)
http://www.epa.gov/reg3wapd/pdf/pdf_npdes/Wastewater/DC/DCMS4permit2011.pdf)

4.1.5 Retrofit Program for Existing Discharges

4.1.5.1 Within two years of the effective date of this permit the District shall develop, notice, and submit to EPA for review and approval a program that establishes performance metrics for retrofit projects. The District shall fully implement the program upon approval. The starting point for the performance metrics shall be the standard in Section Performance metrics may be established generally for all retrofit projects, or for categories projects, e.g., roads, sidewalks, parking lots, campuses. Specific site conditions may constitute justifications for setting a performance standard at something less than the standard in Section 4.1.1, and a similar calculator or algorithm process may be used in conjunction with a specific site analysis.

4.1.5.2 The District, with facilitation assistance from EPA Region III, will also work major Federal landholders, such as the General Services Administration and the Department Defense, with the objective of identifying retrofit opportunities, documenting federal commitments, and tracking pollutant reductions from relevant federal actions.

4.1.5.3 For each retrofit project estimate the potential pollutant load and volume reductions achieved through the DC Retrofit program by major waterbody (Rock Creek, Potomac, Anacostia) for the following pollutants: Bacteria (E. coli), Total Nitrogen, Total Phosphorus, Total Suspended Solids, Cadmium, Copper, Lead, Zinc, and Trash. These estimates be included in the annual report following implementation of the project.

4.1.5.4 The DC Retrofit Program shall implement retrofits for stormwater discharges minimum of 18,000,000 square feet of impervious surfaces during the permit term. A minimum of 1,500,000 square feet of this objective must be in transportation rights-of-way.

4.1.5.5 No later than 18 months following issuance of this permit, the permittee shall, through its Updated DC Stormwater Regulations or other permitting or regulatory mechanisms, implement an enforceable mechanism that will adopt and implement stormwater retention requirements for properties where less than 5,000 square feet of soil is being disturbed but where the buildings or structures have a footprint that is greater than or equal to 5,000 square feet and are undergoing substantial improvement. Substantial improvement, as consistent with District regulations at 12J DCMR § 202, is any repair, alteration, addition, or improvement of a building or structure, the cost of which equals or exceeds 50 percent of the market value of the structure before the improvement or repair is started. The characteristics of these types of projects may constitute justifications for setting a performance standard at something less than the standard in Section 4.1.1.

4.1.5.6 The permittee shall ensure that every major renovation/rehabilitation project for District-owned properties within the inventory of DRES and OPEFM (e.g., schools and school administration buildings) includes on-site stormwater retention measures, including but not limited to green roofs, stormwater harvest/reuse, and/or other practices that can achieve the retention performance standard.

4.1.6 Tree Canopy

4.1.6.1 No later than one year following issuance of this permit, the District shall develop and public notice a strategy to reduce the discharge of stormwater pollutants by expanding tree canopy throughout the city. The strategy shall identify locations throughout the District where tree plantings and expanded tree boxes are technically feasible and commit to specific schedules for implementation at locations throughout the District, with highest priority given to projects that offer the greatest stormwater retention potential. The strategy shall also include the necessary elements to achieve the requirements of Section 4.1.6.2.

4.1.6.2 The District shall achieve a minimum net annual tree planting rate of 4,150 plantings annually within the District MS4 area, with the objective of a District-wide urban tree canopy coverage of 40% by 2035. The annual total tree planting shall be calculated as a net increase, such that annual mortality is also included in the estimate. The District shall ensure that trees are planted and maintained, including requirements for adequately designed and sized tree boxes, to achieve optimal stormwater retention and tree survival rate. Trees shall be planted in accordance with the Planting Specifications issued by the International Society of Arboriculture as appropriate to the site conditions.

4.1.6.3 The District shall annually document the total trees planted and make an annual estimate of the volume of stormwater that is being removed from the MS4 (and combined system, as relevant) in a typical year of rainfall as a result of the maturing tree canopy over the life of the MS4 permit. Also report annually on the status of achieving 40% canopy Districtwide.

4.1.7 Green Roof Projects

4.1.7.1 Complete a structural assessment of all District properties maintained by DRES and slated for redevelopment to determine current roof conditions and the feasibility for green roof installation. These assessments shall be performed on an ongoing basis for all properties as they are considered for redevelopment. Based on the structural assessment and other factors, identify all District-owned properties where green roof projects are technically feasible and commit to specific schedules for implementing these projects.

Highest priority shall be given to projects that offer the greatest stormwater capture potential.

4.1.7.2 The permittee shall install at a minimum 350,000 square feet of green roofs on District properties during the term of the permit (including schools and school administration buildings).

4.1.7.3 Document the square footage of green roof coverage in the District, whether publicly or privately owned, report any incentive programs implemented during the permit term, and estimate the volume of stormwater that is being removed from the MS4 (and combined system, as relevant) in a typical year of rainfall as a result of the combined total green roof facilities in the District.

Florida

Type of Retrofit Requirement: Flood control assessment

Where: Phase I MS4 permits. Example language from Miami Phase I MS4 permit (issued Feb. 3, 2004):

> Flood Control Projects: Water quality impacts on receiving water shall continue to be assessed and minimized for all flood management projects identified in the basin master planning process or comparable planning process. Water quality treatment will be provided for all flood control projects as required by the rules of the applicable water management district. The feasibility of retrofitting existing structural flood control devices to provide additional pollutant removal from stormwater shall be evaluated.

Florida has also been installing a number of retrofit projects through grants and other funding programs, as described in Eric H. Livingston and Borja Crane-Amores, 2007, A Review of Urban Stormwater Retrofitting in Florida (http://www.stormwater.ucf.edu/conferences/9thstormwatercd/documents/UCFretrofitapril2007.pdf).

Hawaii

Type of Retrofit Requirement: Develop retrofit plan/feasibility study

Where: Honolulu Phase I MS4 permit and Hawaii DOT Airports MS4 permit

City and County of Honolulu (MS4 permit effective on June 24, 2011; expires on Sept. 8, 2014):
Part D.1.f(1)(vi) Action Plan/or Retrofitting the Existing MS4 with Structural BMPs. The Permittee shall:

- Continue with the implementation of the activities for Wailupe Stream, Kuliouou Stream, and Niu Stream as described on Pages 10-11 of the "Action Plan: Implementing Feasible Opportunities to Retrofit Structural BMPs," dated October 2001, and submitted to DOH on October 31, 2001, to address retrofitting the existing MS4 with structural BMPs. All structural BMPs as identified in the Action Plan, dated October 2001, shall be completed within five (5) years of the effective date of this permit.
- Evaluate the recommendations of the report titled, "Storm Water Best Management Practices (BMP) Plan for Four Major Outlets at Kaelepupu Pond," Kailua, Hawaii, November 2008.

- Evaluate the recommendations of the draft report titled, "Watershed Based Plan for Reduction of Non point Source Pollution in Wailupe Stream Watershed," dated June 2010.
- Provide the DOH with an updated Action Plan within one (1) year of the effective date of this permit, which shall identify retrofits to be implemented, explanation on the basis for their selection and an implementation schedule, including addressing each of the bulleted items above. The implementation schedule shall cover a five (5) year period and be updated yearly to include additional retrofit projects with water quality protection measures for the 5th year of the schedule. The annual updates to the implementation schedule shall be included in the Annual Report with a description of the projects status. The Action Plan may include, but not be limited to projects in compliance with any TMDL implementation and reduction plan.

Hawaii DOT Airports Division MS4 permit (effective 1/19/07, expires 6/1/11):

Part D.1.e(5) Retrofit Feasibility Study - The Permittee shall complete a feasibility study to retrofit the existing Small MS4 discharging to receiving waters listed pursuant to Section 303(d) of the Act for either sediment, siltation, turbidity, and/or trash. The retrofits may include water quality BMPs to meet State Water Quality Standards. A detailed scope of the feasibility study shall be submitted to DOH within one (1) year of the effective date of this permit. A final feasibility study shall be submitted to DOH within three (3) years of the effective date of this permit. The Permittee shall work with the Army Corps of Engineers, as necessary, to improve the storm water quality features of flood control structures and the DOT-AIR Small MS4.

Louisiana

Type of Retrofit Requirement: Flood control assessment

Where: Phase II MS4 general permit (effective date Dec. 5, 2007). In the good housekeeping minimum measure, MS4s are required to develop "procedures to ensure that flood management projects are assessed for impacts on water quality and existing projects are assessed for incorporation of additional water quality protection devices or practices."

Maryland

Type of Retrofit Requirement: Retrofit a certain percentage of impervious surface area.

Where: All Phase I municipal permittees in Maryland are required to retrofit a certain percent of their impervious surface area. Most of the current permits (which were issued in 2002 – 2005 and are currently administratively extended) require the restoration of 10% of the MS4s impervious surface area. The Montgomery County Phase I MS4 permit, issued in 2010, was the first new Phase I MS4 permit issued since 2005 and include a requirement for the County to retrofit an additional 20% of impervious surfaces (for a total of 30% of impervious surface area).

Montgomery County Phase I MS4 permit (effective date Feb. 16, 2010):

G. Watershed Restoration

The County shall implement those practices identified in PART III. F. above to control stormwater discharges to the MEP. The overall goals are to maximize the water quality in a single watershed, or combination of watersheds; use efforts that are definable and the effects of which are measurable;

and show progress toward meeting any applicable WLAs developed under EPA approved TMDLs. At a minimum, the County shall:

1. By the end of this permit term, complete the implementation of those restoration efforts that were identified and initiated during the previous permit term to restore ten percent of the County's impervious surface area. The watershed, or combination of watersheds where the restoration efforts are implemented shall be monitored according to PART III. H. below to determine effectiveness toward improving water quality.
2. By the end of this permit term, complete the implementation of restoration in a watershed, or combination of watersheds, to restore an additional twenty percent of the County's impervious surface area that is not restored to the MEP. Restoration shall include but not be limited to the use of ESD and other nonstructural techniques, structural stormwater practice retrofitting, and stream channel restoration. These efforts shall be separate from those specified in PART III. G.1. above and shall be monitored according to PART III. H. below to determine effectiveness toward improving water quality.
3. Report annually:
   a. The monitoring data and surrogate parameter analyses used to determine water quality improvements;
   b. The estimated cost and the actual expenditures for program implementation; and
   c. The progress toward meeting any applicable WLAs developed under EPA approved TMDLs in the watersheds established in PART III. G.1. and 2. above where restoration has occurred.

New Mexico

Type of Retrofit Requirement: Flood control and trash assessment for retrofits

Where: Albuquerque's MS4 permit (NMS000101) was issued 10/31/03 (and has not been reissued yet). Permit required MS4 to conduct evaluations of trash reduction needs to reduce levels of floatables, including possible retrofits of detention basins for outlet structures to minimize discharge of floatables (this was due by Dec. 2004). MS4 was required to complete installation of retrofit structures by Dec. 2005. (Part II.A.6.c)

Permit also required evaluation of existing flood control structures to assess feasibility of retrofitting to provide additional pollutant removal (Part II.A.4).

New York

Type of Retrofit Requirement: Development of Retrofit Plan

Where: Phase II MS4 General Permit (issued April 29, 2010) requires a retrofit program (Part IX.A.5.b, page 72) for MS4s in the New York City East of Hudson Watershed.

b. Retrofit program - applicable to traditional land use control, traditional non-land use control and non-traditional MS4s.

Develop and commence implementation of a Retrofit Program that addresses runoff from sites to correct or reduce existing erosion and/or pollutant loading problems, with a particular emphasis placed on the pollutant phosphorus. At a minimum, the MS4 shall:

i. establish procedures to identify sites with erosion and/or pollutant loading problems;

ii. establish policy and procedures for project selection. Project selection should be based on the phosphorus reduction potential of the specific retrofit being constructed/installed; the ability to use standard, proven technologies; and the economic feasibility of constructing/installing the retrofit. As part of the project selection process, the covered entity should participate in locally based watershed planning efforts which involve the Department, other covered entities, stakeholders and other interested parties;

iii. establish policy and procedures for project permitting, design, funding, construction and maintenance.

iv. for covered entities that develop their own retrofit program, by March 9, 2009 develop and submit approvable plans with schedules for completing retrofit projects, including identification of funding sources. Upon DEC approval of those schedules, the plans and schedules shall become enforceable requirements of this permit.

v. pursuant to Part IV. B (Cooperation Between Covered entities Encouraged), retrofit projects can be completed in cooperation with other covered entities in the East of Hudson Watershed through the formation of a cooperative entity with other MS4s. Participating MS4s shall work with the Department and other members of the cooperative entity in implementing the requirements of i, ii and iii above. In addition, each covered entity that becomes a member of the cooperative entity shall work closely with the Department and other members of the cooperative entity to, by December 31, 2009, develop and submit approvable plans and schedules for completing retrofit projects, including identification of funding sources. Upon DEC approval of those plans and schedules, the plans and schedules shall become enforceable requirements of this permit.

North Carolina

Type of Retrofit Requirement: Retrofit program; min. 5 projects per year with 70 total over 5 years

Where: NCDOT permit (effective 9.10.2010) requires a BMP Retrofit program (Part II.B.2). The permit requires that NCDOT locate a minimum of 14 sites per year that are appropriate for retrofit installation and implement at least 5 retrofit projects per year with a total of 70 retrofits implemented over 5-year period of permit. Note that this language is identical to the retrofit requirement in their last MS4 permit.

Oklahoma

Type of Retrofit Requirement: Flood control assessment

Where: Oklahoma City Phase I MS4 permit (issued January 19, 2007)

Flood Control Projects: Impacts on receiving water quality shall be assessed for all flood management projects. The feasibility of retrofitting existing structural flood control devices to provide additional pollutant removal from storm water shall be evaluated.

Oregon

Type of Retrofit Requirement: Stormwater Retrofit Strategy Development

Where: Recently proposed MS4 Phase I permits include a retrofit requirement. All Phase I permits include the following language except Clackmas county which must complete the first CIP project by 2014 instead of 2013. The following example is from the Portland MS4 permit (issued Jan. 31, 2011):

6. Stormwater Retrofit Strategy Development: The co-permittee must develop a stormwater quality retrofit strategy identified in a plan that applies to developed areas identified by the copermittee as impacting water quality and that are underserved or lacking stormwater quality controls.

a. The stormwater retrofit strategy must be based on a co-permittee-defined set of stormwater quality retrofit objectives and a comprehensive evaluation of a range of stormwater quality retrofit control measures and their appropriate use. The co-permittee-defined objectives must incorporate progress towards applicable TMDL wasteload allocations. Development of the stormwater retrofit strategy must allow for public comment and consider public input.

b. The co-permittee must develop and submit a stormwater retrofit plan to the Department by November 1, 2014 that the co-permittee will use to guide the implementation of its stormwater retrofit strategy. The stormwater retrofit plan must describe or reference the following:
   i. Stormwater retrofit strategy statement and summary, including objectives and rationale;
   ii. Summary of current stormwater retrofit control measures being implemented, and current estimate of annual program resources directed towards stormwater retrofits;
   iii. Identification of developed areas or land uses impacting water quality that are high priority retrofit areas;
   iv. Consideration of new stormwater control measures;
   v. Preferred retrofit structural control measures, including rationale;
   vi. A retrofit control measure project or approach priority list, including rationale, identification and map of potential stormwater retrofit locations where appropriate, an estimated timeline and cost for implementation of each project or approach.

c. By November 1, 2013, each co-permittee must identify one stormwater quality improvement project, at a minimum, to be initiated, constructed or implemented during the permit term. The project must target the reduction of applicable TMDL pollutant parameters. The project must be associated with a Capital Improvement Project or other municipal retrofit project or strategy

Tennessee

Type of Retrofit Requirement: Retrofit plan for TMDL waters

Where: Phase II MS4 general permit
http://www.tn.gov/environment/wpc/stormh2o/finals/tns000000_ms4_phase_ii_2010.pdf

3.1.2. Retrofit Plan Requirements in EPA-Approved or Established TMDLs
Where TMDL implementation plans require MS4s to retrofit existing developed sites that are impacting water quality, the retrofit plan must be developed within the timeframes established by the TMDL and must emphasize controls that infiltrate, evapotranspire, or harvest and use stormwater discharges. The plan must include:
a) An inventory of potential retrofit locations, which considers, at a minimum:

- Locations that contribute pollutants of concern to an impaired waterbody
- Locations that contribute to receiving waters that are significantly eroded
- Locations that are tributary to a sensitive ecosystem or protected area
- Locations that are tributary to areas prone to flooding

b) An evaluation and ranking of the inventoried locations to prioritize retrofitting which includes, at a minimum:

- Feasibility
- Cost effectiveness
- Pollutant removal effectiveness
- Impervious area potentially treated
- Maintenance requirements
- Landowner cooperation
- Neighborhood acceptance
- Aesthetic qualities, and
- Efficacy at addressing concern.

3.1.3. Discharges to Impaired Waterbodies without EPA-Approved TMDLs
MS4s that have discharges containing pollutants of concern into a receiving water which has been listed on the Section 303(d) list of impaired waters must document in the SWMP how the BMPs will control the discharge of the pollutants of concern, and must demonstrate that the discharge will not cause or contribute to an impairment. A monitoring component to assess the effectiveness of the BMPs in controlling the discharge of pollutants of concern must also be included in the SWMP. Monitoring can entail a number of activities including but not limited to: outfall monitoring, in-stream monitoring or modeling. Monitoring requirements are further described in part 5 of this permit.

Utah

Type of Retrofit Requirement: Develop retrofit plan

Where: Phase II MS4 general permit (effective August 1, 2010) requires permittees to develop plan to retrofit existing developed sites that are impacting water quality. Phase I permits will be renewed soon to include similar requirement.

From Small MS4 general permit:

4.2.5.3.3 The Permittee must develop a plan to retrofit existing developed sites that are adversely impacting water quality. The retrofit plan must be developed to emphasize controls that infiltrate, evapotranspire or harvest and use storm water discharges. The plan must include a ranking of control measures to determine those best suited for retrofitting as well as those that could later be considered for retrofitting. The Permittee must include the following when developing the criteria for the retrofit plan:

- Proximity to waterbody
- Status of waterbody to improve impaired waterbodies and protect unimpaired waterbodies
- Hydrologic condition of the receiving waterbody
- Proximity to sensitive ecosystem or protected area
- Any upcoming sites that could be further enhanced by retrofitting storm water controls

Texas

Type of Retrofit Requirement: Flood control assessment

Where: San Antonio Phase I MS4 permit

4. Flood Control Projects: The permit requires that impacts on receiving water quality be assessed for all flood control projects and that the feasibility of retro-fitting existing structural flood control devices be evaluated to provide additional pollutant removal from storm water.

The City administers the Capital Improvements Program, which includes drainage system improvements to be targeted in flood-prone areas of the city. As part of its original permit application, flood control devices were retrofitted where feasible.

Washington State

Type of Retrofit Requirement: Program development (structural stormwater control program); performance standard not specified

Where: The Phase I Municipal Stormwater permit for Western Washington (issued January 17, 2007) requires development of a Structural Stormwater controls program. The permit requires the Stormwater Management Program to include a program to construct structural stormwater controls to prevent or reduce impacts to waters of the state caused by discharges from the MS4. The program is specific to areas of existing development and some areas of new development where impacts are anticipated. This program specifically addresses impacts that are not adequately controlled by other required actions of the SWMP. In Washington State, permittees typically include their projects with Capital Improvement Plans or Capital Facilities Plans where public process/involvement takes place. For reporting, each permittee is required to describe the program, list the planned projects, describe how the selected projects comply with AKART and MEP requirements, provide an estimated pollutant load reduction, explain the expected outcomes, and report any monitoring/evaluation results (if applicable).

The Phase I Municipal Stormwater Permit requires the development of a structural stormwater control program (Part S5.C.6, page 13) that addresses areas of existing development. The permit includes minimum performance measures that require:

- Development of a structural stormwater control program, with implementation beginning no later than 18 months after effective date of permit. Permittees must provide a list of planned individual projects.

Wisconsin

Type of Retrofit Requirement: 40% TSS reduction requirement for MS4s

Where: Both the MS4 General permit and MS4 individual permits require permitted MS4s to achieve a 40% reduction in total suspended solids in the existing urban area as compared to no controls by March of 2013. While not a retrofit requirement, per se, many permitted MS4s are finding that they may need to retrofit to meet this performance standard.

The Wisconsin MS4 general permit (effective Jan. 19, 2006) has the following requirement (2.7.1):

2.7.1 To the maximum extent practicable, implementation of storm water management practices necessary to achieve a 40% reduction in the annual average mass of total suspended solids discharging from the MS4 to surface waters of the state as compared to implementing no storm water management controls, by March 10, 2013. The permittee may elect to meet the 40% total suspended solids standard on a watershed or regional basis by working with other permittee(s) to provide regional treatment that collectively meets the standard.

Retrofit Requirements for Chesapeake Bay MS4s over 100,000 in population

Washington, DC
Permit effective on 10/7/2011, expires on 10/7/2016
Part 4.1.5 – Retrofit program for existing discharges requires DC to:

- Within 2 years, develop a program that establishes performance metrics for retrofit projects
- Estimate potential pollutant load and volume reduction for each retrofit project
- Implement retrofit projects for a minimum of 18 million square feet of impervious surfaces during the permit term
- Within 18 months, adopt stormwater retention requirements for projects where less than 5,000 sf of soil is being disturbed, but structure is greater than 5,000 sf and undergoing substantial improvement

Charles County, MD
Permit effective on 7/14/2005, expired on 7/14/2010
Parts III.F and III.G requires the County to:

- Submit and implement detailed watershed management plans to restore at least 10 percent of the County's impervious cover by 7/14/2006
- By 7/14/2010, submit and begin implementing detailed watershed management plans to restore an additional 10 percent of the County's impervious cover

Carroll County, MD
Permit effective 7/14/2005; expired on 7/14/2010
Parts III.F and III.G requires the County to:

- Submit and implement detailed watershed management plans to restore at least 10 percent of the County's impervious cover by 7/14/2006
- By 7/14/2010, submit and begin implementing detailed watershed management plans to restore an additional 10 percent of the County's impervious cover

Frederick County, MD
Permit effective on 3/11/2002, expired on 3/11/2007
Part III.F requires the County to:

- Develop plans for Ballenger Creek and Bush Creek watersheds that provide for treatment of at least 10 percent of Frederick County's impervious area

Harford County, MD
Permit effective 11/1/2004; expired on 11/1/2009

Part III.G, Watershed Restoration, requires the County to:

- Continue efforts from pervious permit term to restore 10 percent of County's impervious surface areas
- By end of permit term, restore an additional 10 percent of County's impervious surface areas

Howard County, MD
Permit effective 6/20/2005; expired on 6/20/2010
Part III.G, Watershed Restoration, requires the County to:

- Continue efforts from pervious permit term to restore 10 percent of County's impervious surface areas
- By end of permit term, restore an additional 10 percent of County's impervious surface areas

Anne Arundel County
Permit effective 11/8/2004; expired on 11/8/2009
Part III.G, Watershed Restoration, requires the County to:

- Continue efforts from pervious permit term to restore 10 percent of County's impervious surface areas
- By end of permit term, restore an additional 10 percent of County's impervious surface areas

Baltimore City, MD
Permit issued 1/3/2005; expired 1/3/2010
Parts III.F. and III.G, Watershed Assessment and Watershed Restoration, requires the City to:

- Continue efforts from pervious permit term to restore 20 percent of City's impervious surface areas
- By end of permit term, restore an additional 10 percent of City's impervious surface areas

Baltimore County, MD
Permit issued 6/15/2005; expired 6/15/2010
Parts III.F. and III.G, Watershed Assessment and Watershed Restoration, requires the County to:

- Continue efforts from pervious permit term to restore 20 percent of County's impervious surface areas
- By end of permit term, restore an additional 10 percent of County's impervious surface areas

Prince George's County, MD
Permit issued 10/14/2004; expired on 10/13/2009
Part III.G, Watershed Restoration, requires the County to:

- Continue efforts from pervious permit term to restore 10 percent of County's impervious surface areas
- By end of permit term, restore an additional 10 percent of County's impervious surface areas

Montgomery County, MD
Permit effective 2/16/2010; expires on 2/15/2015
Part III.G, Watershed Restoration, requires the County to:

- Continue efforts from pervious permit term to restore 10 percent of County's impervious surface areas
- By end of permit term, restore an additional 20 percent of County's impervious surface areas